

account the influence of the acceleration, are, for the three days:—

	1908, Jan. 3	Jan. 11	Jan. 19
$\Delta\alpha$	... +δ 49 $^{\prime}25$	... +δ 40 $^{\prime}31$	... +δ 27 $^{\prime}50$
$\Delta\delta$	... -2 24 $^{\prime}75$	... -2 21 $^{\prime}69$	... -2 21 $^{\prime}65$

whereas the corrections to the published ephemeris, found by Dr. Kobold from Dr. Max Wolf's observations, are of quite a different character:—

	$\Delta\alpha$	$\Delta\delta$
1907 Dec. 25	... ... ... +34 $^{\prime}5$	... ... -24
1908 Jan. 2	... ... ... +35 $^{\prime}2$	... ... -24
" " 13	... ... ... +47 $^{\prime}0$	... ... -4 $^{\prime}9$
" " 14	... ... ... +47 $^{\prime}2$	... ... -3 $^{\prime}6$
" " 15	... ... ... +47 $^{\prime}0$	... ... -2 $^{\prime}4$
" " 18	... ... ... +45 $^{\prime}3$	... ... +0 $^{\prime}5$
" " 19	... ... ... +44 $^{\prime}3$	... ... +1 $^{\prime}4$

It will be seen that the neglected perturbations in no way explain the deviations between the computed and observed places. In declination these differences are particularly striking, and no permissible alterations to the elements will reduce them to the order of errors of observation.

Prof. Backlund makes two suggestions by way of explanation:—(1) that the object observed from December 25 to January 19 was not Encke's comet; (2) that this comet has divided itself into two parts, and that the part that has been observed has, by the process of dislocation, been deflected from the original orbit. Observations in the southern hemisphere, which will be possible in June, will decide this point. Dr. Backlund further points out that, previous to this year, the comet has never been observed before perihelion passage when the date of perihelion falls between April and July.

Dr. Ebell has computed a parabolic orbit from the observations made at Heidelberg, and the result is sufficiently surprising. The dates selected were January 2, 13, and 19, and the middle place is fairly well represented, but the outstanding errors on December 25 were $\Delta\lambda +32^{\prime}40$ and $\Delta\beta +12^{\prime}19$. The elements are as follows:—

$$\begin{aligned} T & \dots 1907 \text{ Dec. } 6:0569 \text{ Berlin M.T.} \\ \omega & \dots 39^{\circ}25'59'' \\ \Omega & \dots 317^{\circ}7'25'' \\ i & \dots 10^{\circ}26'99'' \\ \log q & \dots 0.58448 \end{aligned}$$

The node and inclination are not very different from those of Encke, but the perihelion distance is rivalled only by the comet of 1729. The material is not sufficient to derive an ellipse. It will probably be found that the Heidelberg object is not the comet of Encke.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

LONDON.—The report of the committee of University College for the year 1907-8 has just been issued. During last session there were 1191 students, of whom 171 were registered as post-graduate and research students. The report deals, among other matters, with the work of the faculties for the past year, and gives a list of the researches and original papers published during that year. That list occupies thirteen octavo pages. Among the departments that seem to have been specially productive may be noted the department of applied mathematics under Prof. Karl Pearson, from which no fewer than twenty-eight papers were issued during the year. Seven of these were from the Francis Galton Laboratory of National Eugenics. The departments of chemistry under Sir William Ramsay and Prof. J. Norman Collie produced twenty-four original papers, while the subdepartment of spectroscopy issued seven. The list of post-graduate courses is valuable as an indication of the extensive provision for higher work that is now to be found in London. The report concludes with a summary of the urgent needs

of the college if it is to meet the demands made upon it; they include the following:—

	Estimated Cost	Money Available
New buildings for anatomy, physiology, and pharmacology	£ 50,000	£ 15,250
New buildings for the department of chemistry. (The scheme could be carried out in two sections, costing 40,000, and 30,000, respectively)	70,000	nil
Building alterations and new equipment for botany and pathological chemistry	5,000	nil
Re-fitting of general library and completion of science library	5,000	nil

DR. J. M. FORTESCUE BRICKDALE has been appointed director of the public health laboratory of University College, Bristol.

THE Fishmongers' Company has given 1000l. towards the fund for carrying out the scheme of incorporation of King's College with the University of London.

MR. CARNEGIE has given a further donation of a million pounds sterling to the Carnegie Foundation for the Advancement of Teaching. Attention was directed in our issue of March 12 (p. 452) to the admirable work done already by the foundation, which was two years ago inaugurated by Mr. Carnegie and endowed by him with two millions sterling. The fund, which now amounts to 3,000,000l., is intended primarily to serve for providing retiring allowances for professors and others in universities and colleges in the United States, Canada, and Newfoundland. Originally the benefits of the foundation were confined to privately endowed educational institutions, and Mr. Carnegie has increased the fund so that professors in State institutions may also be eligible to participate in the benefits of the scheme.

THE seventy-fourth annual report of Bootham School (York) Natural History, Literary, and Polytechnic Society, that for 1907, provides excellent evidence that in some English secondary schools at least the out-of-school hours are opportunities in which the boys may follow their natural bent and cultivate their individuality. The boys band themselves together in societies for the outdoor study of numerous branches of natural history; they record meteorological data, study the archaeology of the neighbourhood, practise photography, work in metal and wood, and besides these and other practical pursuits they take part in a flourishing literary society. Boys and masters are to be congratulated upon the report, and the boys also on the fact that they are allowed to manage the societies largely by themselves.

IT is well known, says the Journal of the Royal Society of Arts, that American employers give much more attention than has been the practice in this country to affording facilities to their managers and workpeople for obtaining technical knowledge. For example, a large organisation of spinners and manufacturers at Atalanta (Georgia) has adopted the following scheme for keeping their employees up to date in commercial and technical knowledge of the textile trade. A librarian is employed to secure all the latest books dealing with spinning, weaving, and textile engineering; all periodicals from all parts of the world bearing on the subjects are purchased or otherwise secured. The librarian prepares brief descriptions of the books, to which anyone may refer to get a quick idea of the contents. In some instances the whole periodical is filed; in others special articles are cut out, and sometimes foreign articles are translated and pasted in scrap-books. Everything is carefully indexed, and the library is open to any employee.

A NATURE-STUDY course for women is to be given again this year at the Horticultural College, Swanley, Kent, during the summer holidays. The course will extend from August 1 to 12. Weather permitting, most of the instruc-

tion will be given out of doors, rambles in the country under the guidance of experienced teachers being the chief feature. It is hoped to combine the natural history excursions with points of antiquarian and other interest in outlying districts, and an endeavour will be made to render the course useful, both for home life and school work. The report for 1907 on the work of the college as a whole shows that good progress continues to be made. The chief feature of the year was the establishment of a course in natural history, which has for its object the training of third-year students who have passed the ordinary gardening course at the college and wish to increase their knowledge of natural history subjects in order to qualify as teachers of gardening and nature study.

THE third International Congress for the Development of Drawing and Art Teaching is to be held in London from August 3 to 8 next. Previous meetings in Paris in 1900 and in Berne in 1904 proved very successful in stimulating the application of art to industry. The promoters of the London meeting direct attention to the fact that as a nation Great Britain compares unfavourably with her commercial competitors in the attention paid to applied art in technical schools. On these grounds, with others, an appeal is made to educational authorities and employers of labour to assist in making the forthcoming congress a success, both by contributions to the necessary funds and by interesting administrators and teachers in the scheme. Drawing should be allied with all subjects of study, but it is especially useful to the student of science, and it is to be hoped that the congress will lead to an improvement in the methods of teaching drawing in our schools, as well as to a recognition of its importance in a complete scheme of education. Full particulars of the London meeting can be obtained from the secretary of the congress, 151 Cannon Street, London, E.C.

THE second International Congress of Popular Education is to be held in Paris from October 1 to 4 next. It is being arranged by la Ligue française de l'Enseignement. Invitations have been sent to various educational associations in different parts of the world to send delegates to the congress. All expenses in connection with the congress are to be borne, we understand, by the league. Among the subjects to be introduced and discussed at the meetings in Paris may be mentioned:—Societies for the encouragement of the education of the masses, popular lectures and libraries, the education of women in household and maternal duties, professional education, the international exchange of children for educational purposes, and the system of visits by teachers for the study of foreign methods. It is hoped to publish the addresses and discussions at the congress, and in this way to bring together much valuable experience gained in different countries in the direction of solving difficult educational problems. There is every reason to hope that the meetings will prove even more successful than those of the first congress, held at Milan in 1906. All inquiries should be addressed to M. Léon Robelin, general secretary of la Ligue française de l'Enseignement, 16, rue de Miromesnil, Paris.

THE accounts for the year ending July 31, 1907, of the various London polytechnics show that the total ordinary receipts of all the institutions amounted for the year to 203,952*l.* The grants of the London County Council amounted to 77,358*l.*, or 37.93 per cent. of the total receipts. Grants from the Board of Education reached 32,844*l.*, or 16.11 per cent.; the amounts received from City Parochial Foundation were 28,330*l.*, or 13.89 per cent., and from City companies, &c., 5917*l.*, or 2.90 per cent. The total ordinary expenditure on revenue account of all the institutions amounted to 207,519*l.* Large increases occurred under two heads, viz. "teachers' salaries," 10,317*l.*, and "apparatus and other educational appliances and furniture," 3116*l.* Taking the results as shown by the accounts, it is seen that, so far as ordinary income and expenditure are concerned, there was a deficit of 3567*l.* on the institutions as a whole. With regard to items of an exceptional nature—principally new building works and special equipment—the total income was 15,089*l.*, of which the London County Council's grants amounted to 940*l.*, and the expenditure was 9113*l.* Of

the total amount of revenue, it is interesting to note that the fees of students and members of the various polytechnics amounted in all to 47,255*l.*, or 21.57 per cent., and what are called in the accounts voluntary subscriptions reached 9161*l.*, or 4.18 per cent., nearly twice as much as in the previous year, though other percentages were practically the same in both years.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society. December 5, 1907.—"On the Structure of *Sigillaria scutellata*, Brongn., and other Eusigillarian Stems, in Comparison with those of other Palaeozoic Lycopods." By E. A. Newell **Arber** and Hugh H. **Thomas.** Communicated by Dr. D. H. Scott, F.R.S.

This paper contains the first full account of the structure of the Eusigillariæ or ribbed Sigillarias of the Rhytidolepis section. The stele has a well-marked pith, bounded by a continuous ring of scalariform tracheides—the primary wood—the outer margin of which is crenulated. The ribs are really formed of cortical tissues, and not by fused leaf-bases. They consist largely of phellogen, and externally what is probably a small zone of primary cortex, which lay without the region of secondary meristematic activity, still persists. The leaf-bases, consisting of thin-walled parenchymatous elements, merely form bracket-like projections from the ribs.

The presence of a ligule and a ligular pit has been detected for the first time. The course of the leaf-traces in the leaf-bases and cortical tissues has been followed with important results. The bundle is collateral, and without secondary wood. In the leaf-bases the trace consists of a double xylem strand, the two xylem groups being widely separated. These two strands unite as they pass through the phellogen. The structure of the trace is almost identical with the foliar bundle of the leaf *Sigillariopsis sulcata*, which is obviously simply the leaf of a eusigillarian stem.

The parichnos increases greatly in size as we pass from the exterior of the stem to the inner margin of the periderm. The two strands further unite, first below and then above the trace, so that, at a deep level in the periderm, the trace is completely surrounded by a broad zone of this tissue.

January 16.—"The Conversion of Diamond into Coke in High Vacuum by Kathode Rays." By the Hon. C. V. **Parsons**, C.B., F.R.S., and Alan A. Campbell **Swinton**.

The apparatus employed consisted of a Crookes tube furnished with two concave cup electrodes of aluminium which, when supplied with high-tension alternating current, acted alternately as cathode and anode, and accurately focussed the cathode rays on to the diamond, which was supported on a plate of iridium.

As the proper degree of vacuum was reached by means of mercury pumps, and as the volts were raised, the diamond in each of the two experiments made became red, and then intensely white hot, until with about 9600 volts and 45 milliamperes passing through the tube it commenced to become black.

Finally, with 11,200 volts and 48 milliamperes (537 watts), a rapid disintegration of the diamond took place with considerable increase in volume, the residue having much the appearance and consistency of coke. As measured by a Féry optical pyrometer, the disintegration took place at the temperature of 1890° C.

Observations of the spectra of the residual gases in the tube before and after the conversion of the diamond into coke showed differences, but these were not thought sufficiently marked to determine with exactitude any variation in the nature of the gases present.

January 23.—"Report on the Eruptions of the Soufrière in St. Vincent in 1902, and on a Visit to Montagne Pelee in Martinique. Part ii.—The Changes in the Districts and the Subsequent History of the Volcanoes." By Dr. Tempest **Anderson.** Communicated by Prof. T. G. Bonney, F.R.S.

The principal points of interest in the observations made